

Digital Financial Inclusion and MSME Financial Resilience in Emerging Economies: A PRISMA-Guided Systematic Review and Comparative Thematic Synthesis

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ABSTRACT

This review examines how digital financial inclusion affects access to financial services and resilience among micro, small, and medium enterprises (MSMEs) in emerging economies. It compares India with Kenya, Nigeria, and Indonesia; rural with urban firms; microenterprises with larger enterprises; and traditional banking with digital financial services. A bounded, PRISMA-guided search produced 200 relevance-ranked academic records from four predefined search blocks and 11 institutional reports. After deduplication and screening, 39 sources published between 2016 and September 2026 were included: 28 peer-reviewed studies and 11 institutional reports. Eight related themes emerged: formal credit, digital payments, financial and digital literacy, trust and cybersecurity, infrastructure, government support, business resilience, and gender and regional inequality. Digital payments produced the most consistent immediate benefit by reducing transaction friction and supporting sales, supplier payments, and cash-flow visibility. However, credit access did not follow automatically and continued to depend on documentation, risk models, and formal records. Literacy, connectivity, perceived security, and regulatory support influenced the conversion of access into productive use. The resilience effect was strongest when digital finance formed part of a broader capability set that included savings, access to working capital, digital records, and multiple sales channels. Policy should therefore move beyond account opening and payment adoption towards responsible data-based lending, interoperable systems, effective consumer protection, and targeted capability support for rural, women-owned, and microenterprises.

Keywords: digital financial inclusion; MSMEs; financial resilience; digital payments; fintech; emerging economies; PRISMA; thematic synthesis

INTRODUCTION

Micro, small, and medium enterprises support employment, local trade, household livelihoods, and income generation across emerging economies, yet they often operate in precarious financial conditions. A delayed payment, supply shortage, health emergency, or sudden decline in customer demand can rapidly exhaust working capital. Conventional banking has not eliminated this vulnerability. Many firms are too small, informal, geographically distant from branches, or poorly documented to meet standard lending requirements. The financing problem therefore extends beyond whether a firm has a bank account. It concerns whether the business can make and receive payments on time, protect liquidity, build a financial buffer, establish a credible financial history, and obtain suitable finance during a crisis.

Digital finance is changing this situation through mobile and electronic payments, platform data, digital identity, remote onboarding, and automated decision systems. These tools can reduce transaction costs and travel time, separate business and household cash flows, create financial records, extend market reach, and accelerate credit assessment. Evidence from eastern sub-Saharan Africa indicates that firms using mobile money are more likely to obtain loans or credit lines (Gosavi, 2018). Studies in India and Indonesia likewise associate fintech use, digital payments, and financial capability with inclusion or business performance (Amnas et al., 2024; Daud et al., 2022; Johri et al., 2024). However, these gains are uneven. Weak networks limited digital capability, fear of fraud, opaque lending terms, and inadequate recourse

can turn nominal access into ineffective or risky use. It is important to distinguish access from resilience. Access concerns the availability and use of financial services. Resilience refers to an enterprise's capacity to anticipate, absorb, withstand, and recover from financial shocks without closing operations. Digital payments may allow transactions to continue when physical sales channels are disrupted, but they do not automatically provide emergency liquidity. A digital loan may close a working-capital gap, yet unsuitable pricing or repeated short-term borrowing can increase financial stress. A systematic review must therefore examine the conditions under which digital finance develops into a broader operational capability rather than assuming that all forms of digital adoption have the same effect.

This article addresses four review questions: (1) How does digital financial inclusion affect MSME access to financial services? (2) What factors constrain MSME adoption and effective use of digital financial services? (3) How do institutional and technological conditions differ across emerging economies? (4) What is the relationship between digital finance and MSME financial resilience? The analysis compares four settings with distinct pathways: India's public digital infrastructure and rapidly expanding payment ecosystem; Kenya's mature mobile-money system; Nigeria's growing network of banks, fintech firms, and agents; and Indonesia's platform-based digital economy and fintech-lending market. It also compares rural and urban MSMEs, microenterprises and larger MSMEs, and traditional banking with digital financial services.

The review makes three contributions. First, it distinguishes payment access from credit access and avoids treating widespread digital payment use as equivalent to comprehensive financial inclusion. Second, it identifies the conditions that convert access into resilience. Third, it highlights continuing evidence gaps, including limited direct rural-urban comparisons, longitudinal data on firm survival, and consistent disaggregation by enterprise size and owner gender.

2. CONCEPTUAL FOUNDATIONS

2.1 Digital financial inclusion

Digital financial inclusion refers to the ability to access and use affordable, responsible financial services through digital channels, together with the capability and confidence needed to use them effectively. Relevant services include payments, deposits, credit, insurance, remittances, and financial-management tools. This definition gives attention to use and quality as well as access. An inactive wallet, an account used only for withdrawals, or a loan accepted without understanding its cost represents limited inclusion. The World Bank's digital-finance framework and Global Findex evidence similarly distinguish ownership from use and emphasise payments, savings, borrowing, and resilience (Demircuc-Kunt et al., 2022; World Bank, 2022).

Digital inclusion can support MSMEs through three related pathways. The transaction mechanism reduces the cost and time required to transfer funds. The information mechanism converts payment and sales activity into records that can reduce information asymmetry. The capability mechanism gives owners tools to monitor cash flows, plan payments, and respond more quickly to shocks. The effectiveness of these pathways depends on network quality, interoperability, market competition, regulation, digital identity, consumer protection, and the owner's financial and digital literacy.

2.2 MSME financial resilience

Financial resilience is the ability of an enterprise to meet essential payments, manage liquidity, obtain or reallocate finance, and recover from a shock without prolonged arrears or distress borrowing. It includes both buffers and adaptive capacity. Buffers comprise cash, savings, insurance, and unused credit. Adaptive capacity includes digital records, multiple payment channels, remote customer access, supplier coordination, and the ability to modify the business model. These distinctions became especially visible during the COVID-19 pandemic. Digital channels supported business continuity, but firms continued to face declining demand and liquidity shortages (Ashiru et al., 2023; Hossain et al., 2022).

Table 1: Analytical links between digital finance and MSME resilience

Digital function	Immediate enterprise effect	Possible resilience outcome	Main condition
Digital payments	Faster receipts and supplier payments	Cash-flow continuity and lower transaction disruption	Acceptance network, interoperability and connectivity
Digital savings	Safer separation and storage of funds	Liquidity buffer for small shocks	Trust, affordability and regular use
Digital credit	Remote application and faster decision	Working-capital support during stress	Responsible pricing, suitable term and reliable assessment
Transaction records	Visible sales and repayment history	Reduced information asymmetry and improved credit assessment	Data quality, consent and lender use
Financial tools	Budgeting, invoicing and cash-flow monitoring	Earlier response to liquidity pressure	Digital and financial capability

Digital finance function	Immediate enterprise effect	Possible resilience outcome	Main condition
Digital channels	Remote customer and supplier interaction	Sales and operational continuity	Logistics, platform access and cybersecurity

METHOD

3.1 Review design

The study used a bounded systematic review with a comparative thematic synthesis. Reporting followed the logic of the PRISMA 2020 statement (Page et al., 2021), while recognising that the search was designed for a focused article rather than an exhaustive bibliographic census. The unit of analysis was an empirical study, review or institutional report that examined digital financial access, adoption, use, performance or resilience in relation to MSMEs or closely comparable microenterprise activity in emerging or developing economies.

3.2 Search strategy and sources

The academic search was completed on 20 September 2026. OpenAlex was used as the bibliographic discovery index because it permits reproducible metadata retrieval across publishers. The publication window was January

2015 to December 2025, allowing a complete final publication year. Four search blocks were used: digital financial inclusion and MSMEs in emerging economies; digital finance, SMEs and resilience; mobile money, micro or small enterprise and financial access in Africa; and fintech or MSME credit in India, Indonesia, Nigeria and Kenya. For each block, the first 50 English-language records ranked by relevance were exported. The relevance cap produced a transparent and reproducible bounded corpus of 200 academic records.

Institutional searching covered World Bank, International Finance Corporation, Asian Development Bank, OECD, Reserve Bank of India, Ministry of Micro Small and Medium Enterprises, SIDBI, Central Bank of Kenya and FinAccess partners, Enhancing Financial Innovation and Access in Nigeria, and Indonesia's Financial Services Authority. Eleven reports published between 2017 and September 2026 were retained. Citation details and digital object identifiers were checked against publisher or Crossref metadata when available.

Table 2: Search framework

Source block	Core search concepts	Limits	Records retained for screening
Academic block 1	digital financial inclusion; MSME; emerging economies	English; 2015-2025; top 50 by relevance	50
Academic block 2	digital finance; SME; resilience	English; 2015-2025; top 50 by relevance	50
Academic block 3	mobile money; micro or small enterprise; financial access; Africa	English; 2015-2025; top 50 by relevance	50
Academic block 4	fintech; MSME credit; India; Indonesia; Nigeria; Kenya	English; 2015-2025; top 50 by relevance	50
Institutional search	MSME finance, digital payments, inclusion, resilience and country conditions	Official reports; 2017-Sep 2026	11

3.3 ELIGIBILITY CRITERI

Table 3: Eligibility criteria

Criterion	Included	Excluded
Population	Micro, small or medium enterprises, owners, entrepreneurs or financial-service agents serving comparable firms	Household-only studies without an enterprise or livelihood pathway; large firms only
Exposure	Digital payments, mobile money, mobile banking, fintech, digital credit, digital records or digitally delivered financial services	General digitisation without a finance component
Outcome	Access, adoption, credit, payment use, financial behaviour, performance, continuity, recovery or resilience	Technology attitudes with no financial or enterprise outcome
Context	Emerging and developing economies, with priority comparisons for India, Kenya, Nigeria and Indonesia	High-income-only settings with no transferable emerging-economy evidence
Evidence	Peer-reviewed empirical research, systematic review or authoritative institutional report	Commentary, promotional material, unsupported opinion or incomplete metadata
Language and period	English; academic studies 2015-2025; institutional reports to September 2026	Outside the stated period or unavailable in English

3.4 Screening and PRISMA flow

The four academic exports contained 200 records. Twenty-two duplicate records were removed, leaving 178 unique academic records. The 11 institutional reports produced a combined screening set of 189 records. Title and abstract screening excluded 121 records that did not meet the population, exposure, outcome or context criteria. Sixty-eight reports were sought for eligibility

assessment; two could not be retrieved in sufficient detail. Twenty-seven of the 66 assessed reports were excluded, mainly because they were not MSME-specific, did not examine a digital-finance exposure, lacked an enterprise outcome, duplicated an included dataset or provided insufficient methodological information. The final synthesis included 39 sources: 28 peer-reviewed studies and 11 institutional reports.

Figure 1: PRISMA-guided flow of evidence selection

Academic records exported from four search blocks (n = 200)
↓
Duplicate records removed (n = 22)
↓
Unique academic records and institutional reports screened (n = 189)
↓
Records excluded during title and abstract screening (n = 121)
↓
Reports sought for eligibility assessment (n = 68)
↓
Reports not retrieved in sufficient detail (n = 2)
↓
Reports assessed for eligibility (n = 66)
Reports excluded (n = 27)
Sources included in the qualitative synthesis (n = 39: 28 peer-reviewed studies and 11 institutional reports)

3.5 Quality appraisal and synthesis

Quality was assessed according to study design. Quantitative studies were examined for sampling clarity, construct measurement, model fit, and alignment between

results and conclusions. Qualitative studies were examined for consistency among the research question, data collection, analysis, and interpretation. Reviews were checked for a stated search strategy, eligibility criteria,

and traceable synthesis. Institutional reports were assessed for authority, scope, methods, recency, and transparency. These criteria drew on the logic of the Mixed Methods Appraisal Tool and the AACODS approach to grey literature. The review did not reduce diverse designs to a single score. Greater weight was given to higher-confidence evidence, while lower-confidence studies were used only when they corroborated stronger or independent sources.

A structured matrix captured country, enterprise size, setting, sample, digital-finance mechanism, outcome, barriers, and reported direction of association. Initial themes were drawn from the review brief and then combined, separated, or qualified as comparisons emerged. The synthesis was interpretative and comparative. A meta-analysis was not attempted because the included studies used substantially different measures of digital finance, inclusion, performance, and resilience.

4. RESULTS

4.1 Profile of the evidence

Of the 28 peer-reviewed studies, five focused on India, seven on Indonesia, four on Nigeria, three on Vietnam, two on Kenya or eastern sub-Saharan Africa, and seven on other emerging-economy or cross-country settings. Quantitative cross-sectional surveys and structural equation modelling were the most common designs. The corpus also included a smaller number of qualitative interviews, mixed-method studies, enterprise-survey analyses, case studies, and systematic reviews. Direct measures of survival or post-shock recovery were uncommon. Most studies measured adoption, inclusion, financial behaviour, or performance and then inferred a resilience pathway.

The institutional evidence broadened the comparison. Global reports described financing gaps, account use, and the role of digital financial services, while country sources supplied current information on payment systems, credit ecosystems, financial inclusion, and MSME policy. Overall, the evidence was strongest regarding mechanisms and enabling conditions and weaker regarding the causal effect of digital finance on long-term enterprise resilience.

Table 4: Representative studies in the comparative evidence base

Study	Setting and method	Digital finance focus	Main contribution to synthesis
Suri and Jack (2016)	Kenya; long-run household evidence	Mobile money	Shows savings and risk-management pathways, with stronger gains for women and movement into business activity
Gosavi (2018)	Eastern sub-Saharan Africa; World Bank Enterprise Surveys	Firm mobile-money use	Links use with a higher likelihood of loans or credit lines and greater productivity
Ibor et al. (2017)	Nigeria; MSME survey	Financial inclusion and digital payments	Finds positive MSME effects but persistent distance and infrastructure barriers
Tengeh and Talom (2020)	Cameroon; 285 SMEs plus interviews	Mobile money	Identifies accessibility, safety and convenience as adoption drivers, alongside trust and cost concerns
Buteau (2021)	India; ecosystem analysis	Digital public and market infrastructure	Shows that MSME gains depend on coordinated platforms, institutions and capability
Iheanachor et al. (2021)	Nigeria; mobile-money agent case	Agent business models	Shows that weak agent viability can constrain last-mile inclusion
Daud et al. (2022)	Indonesia; 190 SMEs	Digital finance and payments	Reports positive associations with financial performance
Gupta et al. (2022)	India; 117 MSMEs	Fintech adoption	Highlights usefulness, ease of use, trust, prior experience and government support
Thathsarani and Jianguo (2022)	Sri Lanka; 366 SME owner-managers	Digital finance and inclusion	Finds digital finance and technology acceptance support the inclusion-performance relationship
Ashiru et al. (2023)	Nigeria; qualitative study of 42 SMEs	Digital communication technologies	Explains resilience through connection, collaboration, process diversification and supply-chain flexibility

Study	Setting and method	Digital finance focus	Main contribution to synthesis
Johri et al. (2024)	India; 998 micro enterprises	Digital financial inclusion	Identifies internet access, education and owner experience as determinants and links inclusion to lower business obstacles
Amnas et al. (2024)	India; 608 fintech users	Fintech and inclusion	Shows the importance of trust, security, service quality, literacy and perceived regulatory support
Al-Shami et al. (2024)	Indonesia; 535 batik enterprises	Digital financial literacy	Links literacy to inclusion and shows social-media use strengthens the relationship
Sun and Zhang (2024)	China; enterprise and regional index data	Digital financial inclusion	Finds innovation effects through reduced financing constraints, with regional differences

4.2 Access to formal credit

The evidence supports a positive but qualified relationship between digital finance and formal credit access. Mobile money and digital payments create observable transaction histories and reduce the cost of serving geographically dispersed firms. Gosavi (2018) found that mobile-money users among firms in eastern sub-Saharan Africa were more likely to secure loans or credit lines. Digital credit and fintech lending can also accelerate applications and use alternative data when conventional financial statements are unavailable. The World Bank's review of fintech and SME finance identifies these opportunities but emphasises that data quality, model governance, and responsible lending remain essential (World Bank, 2022). The conversion of transactions into credit is not automatic. Traditional lenders continue to rely on collateral, registration, accounting or tax records, and stable income. Smaller firms may use digital payments extensively yet remain invisible to lenders when their records are fragmented across wallets and platforms. In Indonesia, fintech lending may broaden inclusion, but loan structure and platform practices influence both efficiency and credit quality (Pambudianti et al., 2020). Evidence from Ethiopia further indicates that borrowing costs, institutional conditions, and collateral continue to shape SME access despite inclusion policies (Oshora et al., 2021). Digital finance can therefore reduce information and delivery costs without eliminating risk-related and formalisation barriers.

4.3 Digital payment adoption

Digital payments produced the most consistent immediate benefit in the evidence. They accelerated fund transfers, enabled remote sales, simplified supplier payments, and improved record keeping. Survey evidence from Indonesia associated digital finance and digital payments with stronger financial performance (Daud et al., 2022). African mobile-money studies similarly highlighted accessibility, convenience, and the capacity to transact outside branch networks (Gosavi, 2018; Tengeh & Talom, 2020).

Payment adoption can also support resilience. During mobility restrictions or local disruptions, firms with remote payment and communication tools can remain connected to customers, diversify processes, and

coordinate supply chains (Ashiru et al., 2023; Hossain et al., 2022). However, this benefit depends on reliable and widely accepted payment rails. Failed transactions, settlement delays, cash-out constraints, fees, and weak dispute resolution can create new liquidity problems. The comparison therefore favours interoperable and dependable payment ecosystems, not merely high numbers of registered merchants.

4.4 Financial and digital literacy

Financial and digital literacy emerged as the most consistent demand-side condition. Literacy supports product knowledge, cost comparison, record keeping, interpretation, and financial decision-making. In India, digital financial literacy mediated the relationship between fintech use and financial inclusion, while perceived regulatory support strengthened this relationship (Amnas et al., 2024). Among batik enterprises in Indonesia, financial and digital financial literacy were positively related to inclusion, and social-media use strengthened these relationships (Al-Shami et al., 2024). Evidence from the Philippines suggested that digital financial services alone did not improve saving, borrowing, and investment practices; financial literacy retained a direct role (Angeles, 2022).

These findings help explain why access programmes sometimes produce limited enterprise effects. Owners may accept digital payments while continuing to mix personal and business finances, withdraw receipts for personal use, or avoid loans because they do not understand the terms. Capability programmes should therefore be linked to business tasks such as cash-flow planning, invoice processing, fraud detection, loan-cost comparison, and maintenance of usable electronic records. Generic awareness campaigns are less likely to change resilience-related behaviour.

4.5 Trust, cybersecurity, and service quality

Trust is not a peripheral preference; it influences whether owners retain digital balances, share data, accept credit, and continue using a service after a problem. Studies in India and African markets repeatedly identify perceived security, service quality, safety, and trust as predictors of adoption (Amnas et al., 2024; Gupta et al., 2022; Siano et al., 2020; Tengeh & Talom, 2020). Common concerns include phishing, account takeover, agent impersonation,

hidden fees, data misuse, and inadequate redress after an error.

Cybersecurity also has a distributional effect because even a small loss may represent a large share of a microenterprise's working capital. Less digitally literate firms may face a greater verification burden or depend more heavily on intermediaries. Policies that promote adoption without clear disclosures, rapid complaint handling, proportionate liability, and continuous confidence building may increase exposure. Trust must therefore be earned through service design, supervision, and visible redress rather than assumed to follow automatically from regulation.

4.6 Infrastructure and geographic barriers

Connectivity, electricity, device quality, identity systems, and agent liquidity determine whether a digital service is genuinely available. Although India and Indonesia have large-scale digital ecosystems, micro and rural enterprises continue to experience disparities in connectivity and capability. Johri et al. (2024) demonstrated the importance of internet access for digital financial inclusion among Indian microenterprises. Evidence from Nigeria continues to identify distance and infrastructure limitations as barriers (Ibor et al., 2017). In Kenya, mature mobile-money networks reduce reliance on bank branches, but cash-in and cash-out access and agent reliability remain important in remote areas.

The rural-urban divide therefore extends beyond account ownership. Rural firms may have fewer acceptance points, lower agent liquidity, less smartphone access, weaker networks, higher logistics costs, and less formal documentation. Urban firms generally benefit from denser customer networks and competing providers, although they may face greater cybercrime and platform-dependence risks. Because few studies test these differences within the same research design, the strength of comparative claims remains limited.

4.7 Government support and institutional conditions

Public policy influences digital financial inclusion through identity systems, payment infrastructure, interoperability, licensing, credit information, data protection, consumer protection, and MSME support. India's ecosystem, including initiatives associated with the Reserve Bank of India and the Small Industries Development Bank of India, illustrates the potential of public digital rails and scaled payment systems.

Evidence also indicates that credit and portfolio quality vary across borrower and lender types (Reserve Bank of India, 2026; Small Industries Development Bank of India, 2026). Indonesia has an evolving mix of bank, e-money, platform, and peer-to-peer channels. Kenya's mobile-money pathway has emphasised telecommunications-led innovation and agent reach. Nigeria has a more plural banking, fintech, and agent-banking structure, in which institutional constraints and trust continue to affect last-mile use.

Government support also shapes beliefs about adoption. Gupta et al. (2022) identified government support as a

relevant factor in fintech acceptance among Indian MSMEs, while Amnas et al. (2024) found that perceived regulatory support had a moderating effect. Regulation must therefore be understandable and usable. Rules that exist formally but do not improve disclosure, recourse, or interoperability may have little effect on enterprise confidence.

4.8 Business resilience

The resilience pathway is cumulative. Digital payments support transaction continuity, digital records improve transparency, savings and working-capital products provide buffers, and communication and platform tools connect firms with customers and suppliers. Together, these capabilities permit faster adaptation than any single product. Research on the COVID-19 period showed that digital transformation gained momentum, although cash-flow constraints remained significant (Hossain et al., 2022). Nigerian SMEs used digital communication technologies to strengthen connections and collaboration, diversify processes, and improve supply-chain flexibility (Ashiru et al., 2023).

Direct evidence on long-term survival remains limited. Most studies use cross-sectional self-reports and treat performance as a proxy for resilience. Nevertheless, the evidence points in a consistent direction: digital finance supports resilience when it expands appropriate access to finance, strengthens cash-flow control, broadens transaction channels, and provides suitable liquidity. Its effect is weaker when firms face collapsing demand, unaffordable credit, unstable systems, or limited capability. Digitalisation is therefore an enabling resource, not a substitute for viable markets and sound financial management.

4.9 Gender and regional inequalities

Women-owned businesses may benefit from remote access because digital channels can reduce time, social, and travel constraints. Long-term evidence from Kenya identified stronger welfare and occupational effects for women, including movement from agriculture into business activity (Suri & Jack, 2016). Indian evidence links digital financial awareness and knowledge among women entrepreneurs with more informed financial decisions and greater use of digital platforms for payments, loans, and asset management (Peter et al., 2024).

These benefits coexist with disparities in access to devices, identification, collateral, networks, and digital skills. Regional inequality operates in a similar way. Sun and Zhang (2024) found that the innovation effects of digital financial inclusion differed across regions in China. In India and Indonesia, large national ecosystems can conceal local gaps in connectivity, capability, and market access. Uniform adoption targets are therefore less suitable than programmes tailored to gender and location.

5. COMPARATIVE THEMATIC SYNTHESIS

Table 5: Comparison of country pathways

Dimension	India	Kenya	Nigeria	Indonesia
Dominant pathway	Public digital infrastructure, bank-linked payments and fintech	Mobile-money and agent ecosystem	Bank, fintech, mobile and agent-banking mix	Platform economy, e-money and fintech lending
Main strength	Scale, interoperability and growing digital records	Deep everyday use and reach beyond branches	Large market and diverse provider innovation	Strong platform integration and active MSME digitalization
Persistent constraint	Credit conversion, capability and rural or micro-enterprise gaps	Enterprise credit linkage and uneven remote service quality	Trust, cyber risk, infrastructure and agent viability	Literacy, fragmented records, responsible lending and regional capability
Resilience channel	Payments, records, formalisation and potential cash-flow lending	Fast transfers, savings, risk sharing and continuity	Remote transactions, customer reach and process flexibility	Payments, market access, financial capability and platform finance
Priority	Translate payment data into responsible, consent-based MSME finance	Deepen enterprise products while protecting mobile-money reliability	Strengthen redress, infrastructure and sustainable agent economics	Improve interoperability, literacy and responsible platform credit

5.1 India and selected emerging economies

India follows a different pathway from African mobile-money ecosystems, relying more heavily on public digital infrastructure, bank-linked payments, and digital identity. Its expansion is driven by payment infrastructure, perceived usefulness, and increasing MSME acceptance of fintech; however, internet access, owner experience, trust, and familiarity remain important (Gupta et al., 2022; Johri et al., 2024). Kenya demonstrates how a widely used mobile-value system can become an everyday resilience resource. Nigeria extends reach through agents and fintech firms, although infrastructure, fraud concerns, and weak agent business models constrain reliability. Indonesia represents a platform-based model in which digital payments, fintech lending, social media, and digital literacy are closely associated with enterprise inclusion and performance.

The comparison indicates that no single institutional model is universally applicable. India's scale does not guarantee suitable credit for the smallest firms, and Kenya's mobile-money depth does not by itself resolve enterprise-financing constraints. Nigeria's provider diversity requires stronger trust and institutional structures, while Indonesia's platform dynamism requires interoperable records, literacy, and responsible credit. The shared policy challenge is to convert digital transactions into financial capability and appropriately priced finance.

5.2 Rural and urban MSMEs

Urban MSMEs are more likely to operate within dense acceptance networks with reliable connectivity, multiple providers, and local support. They may also generate more complete digital records because a larger share of customers pays electronically. Rural firms gain more from

avoiding travel, but their services are more vulnerable to weak connectivity, shared devices, cash-out constraints, limited recourse, and agent-liquidity shortages. Thus, a viable digital product may offer greater additional value in rural areas while also facing a higher risk of service failure.

Rural policy priorities include offline or low-bandwidth functions, support for agents, assisted onboarding, local-language training, and links to agricultural or supply-chain payments. Urban policy should focus more strongly on fraud, platform concentration, data portability, and overborrowing. Because few included studies reported directly matched rural-urban estimates, these conclusions should be interpreted as a synthesis of mechanisms rather than a measured comparison of effect sizes.

5.3 Micro enterprises and small and medium enterprises

Microenterprises face the greatest documentation and capability constraints. Business and household finances may be intermingled, turnover may be largely cash-based, and owners may lack collateral or audited accounts. Digital payments can create the first consistent transaction record, but irregular revenue may still make automated credit costly or unsuitable. Evidence on Indian microenterprises indicates that internet access, education, owner experience, and enterprise size interact with capability (Johri et al., 2024).

Small and medium enterprises have greater scope to integrate payments with accounting, inventory, payroll, and bank credit. Their resilience gains may therefore arise more from integration, cash-flow forecasting, and access to multiple sources of finance. A tiered policy approach is required. Microenterprises need basic products, capability

support, and safeguards against inappropriate short-term credit. Larger SMEs need interoperable data, working-capital products, and tools that connect business information with finance.

5.4 Traditional banking and digital financial services

Traditional banks provide regulated deposits, larger credit products, and relationship-based services. However, branch processes may be slow, cumbersome, and expensive for small transactions. Digital providers reduce distance and processing costs and can use alternative data, but their product terms may be short, complex, or unsuitable. Agent-assisted digital models occupy an intermediate position by combining local cash access with electronic rails.

The evidence does not support replacing banks with fintech firms. Instead, it favours a complementary architecture in which banks provide balance-sheet capacity and prudential safeguards, fintech firms improve interfaces and data use, payment systems provide interoperable rails, and agents offer last-mile assistance. Open, consent-based data portability may reduce fragmentation, but it must be accompanied by privacy protection, model governance, and effective recourse.

6. DISCUSSION

In response to the first review question, the synthesis shows that digital inclusion improves access most clearly by reducing transaction costs, enabling remote delivery, and generating transaction records. Its effect on credit is positive but less consistent because lenders continue to price formalisation, collateral, revenue stability, and institutional information. Digital payments are therefore an entry point to inclusion rather than its endpoint.

The second review question concerns barriers to adoption. The evidence groups these barriers into capability, trust, infrastructure, product, and institutional conditions. Financial and digital literacy influence productive use, while trust and perceived security affect continued use. Connectivity, electricity, device access, and agent liquidity determine availability. Pricing, repayment structure, and interface design shape suitability, and regulation, interoperability, and consumer protection influence confidence in the ecosystem. Because these barriers are interdependent, improving only one is likely to produce limited results.

The third review question concerns differences in country conditions. The four settings display distinct path dependencies. Mobile money and agents shaped Kenya's ecosystem. India's pathway relies more heavily on public digital infrastructure and bank-linked payments. Nigeria has a plural market in which institutional quality and last-mile economics are particularly visible. Indonesia has a large platform economy encompassing e-money payments and fintech lending. Although all four pathways seek to reduce the cost of serving small businesses, they distribute capabilities and risks differently and therefore require different policy priorities.

The fourth review question concerns resilience. The evidence supports a capability-bundle explanation: digital finance strengthens resilience when payments, savings, credit, record keeping, and communication tools reinforce one another. A firm that accepts online payments but lacks savings and appropriate credit remains vulnerable to a demand shock. Likewise, poorly documented cash flow can make even an available loan risky or unsuitable. A firm with integrated records, multiple transaction channels, and access to a liquidity buffer can respond faster and recover more effectively. This interpretation connects financial inclusion with a dynamic-capabilities approach to adaptation.

The review also identifies a measurement problem. Many studies use intention, adoption, or perceived performance as endpoints. Although relevant, these outcomes do not directly show whether a firm avoids distress borrowing, maintains employment, or restores revenue after a shock. Future studies should distinguish access, active use, productive use, and resilience outcomes. Without this sequence, claims about digital finance may outpace the available evidence.

7. IMPLICATIONS

7.1 Policy implications

Policy should shift from account-opening targets towards productive-use and resilience indicators. Useful measures include the proportion of firms receiving regular digital payments, maintaining separate and interoperable business records, holding an emergency liquidity buffer, accessing working-capital finance, and obtaining timely grievance resolution. These indicators link inclusion more directly to enterprise outcomes.

Responsible cash-flow lending should be a priority. Payment and invoice data can improve the assessment of firms that lack traditional collateral, but consent, data quality, portability, and model governance are essential. Regulators should require transparent disclosure of total borrowing costs, appropriate repayment schedules, safeguards against harmful refinancing, and a documented route to human review. Credit expansion that increases over-indebtedness does not strengthen resilience.

Infrastructure policy should focus on the points at which digital systems fail during use. Rural and peri-urban areas require reliable connectivity, agent liquidity, offline functionality, and local support. Payment interoperability and predictable settlement are especially important for small firms because even a short delay can affect inventory purchases or payroll. Cybersecurity support should be practical and proportionate, including verified communications, transaction alerts, simple authentication recovery, and rapid detection of suspected fraud.

Capability building should be segmented by enterprise size and owner needs. Microenterprise training should address digital record keeping, interpretation of loan terms, separation of business and household funds, and fraud recognition. Larger SMEs may need support with accounting integration, cash-flow forecasting, and data portability. Firms that are new to digital services or owned by women may benefit from trusted local intermediaries,

peer networks, and products designed for irregular cash flows rather than standardised assumptions.

7.2 Managerial implications

MSMEs should view digital finance as part of financial management rather than merely a convenient payment method. Practical steps include separating business and household funds, synchronising digital records, maintaining more than one viable payment channel, monitoring settlements and fees, building a liquidity reserve, and evaluating the total cost and duration of credit. Transaction histories become valuable only when they are sufficiently organised to support business decisions or financing applications.

Financial institutions and fintech firms should design for cash-flow volatility and limited administrative capacity. Short forms, local-language explanations, and rapid onboarding can help, but borrowers must understand the product after approval. Providers can strengthen resilience by combining financial data with invoicing tools, reminders, savings options, and flexible working-capital products. Clear complaint tracking and visible security practices are also essential because trust influences both adoption and continued use.

7.3 Research agenda

Future research should use longitudinal designs that observe firms before and after a shock. Outcomes should include survival, recovery time, revenue volatility, employment retention, arrears, and distress financing. Studies should consistently disaggregate results by enterprise size, sector, owner gender, rural or urban location, and market orientation. Direct comparisons among traditional bank customers, fintech users, and hybrid users would help determine whether these services are complementary or substitutive.

Causal evidence is also needed on the use of transaction data in credit decisions. Researchers should examine whether digital histories improve approval, pricing, and repayment after accounting for selection effects. They should also determine how benefits and risks are distributed. Algorithmic exclusion, data misuse, fraud losses, platform dependence, and repeated digital borrowing may weaken resilience, especially among less-experienced microenterprise operators.

8. LIMITATIONS

This review has four limitations. First, the academic search applied a predefined relevance cap of 50 records per search block. Although reproducible, this design may have omitted relevant studies ranked below the threshold; consequently, the review is PRISMA-guided rather than a complete bibliographic census. Second, definitions and measures of inclusion, performance, and resilience were inconsistent, which precluded meta-analysis. Third, many included studies were cross-sectional and based on self-reports, so causal conclusions should remain cautious. Fourth, direct rural-urban and enterprise-size comparisons were limited. The comparative findings therefore synthesise the available studies and institutional context and should be tested with harmonised firm-level data

CONCLUSIONS:

Digital financial inclusion can strengthen MSME

resilience, but its impact depends on what occurs after access. The clearest initial benefit is the ability of digital payments to sustain transactions, reduce distance, and generate records. Greater credit access, stronger financial decisions, and improved recovery capacity emerge when payment use is combined with literacy, trust, reliable infrastructure, suitable savings and credit products, and effective regulation.

India, Kenya, Nigeria, and Indonesia provide different institutional responses to the same challenge. India demonstrates the scale potential of public digital infrastructure; Kenya illustrates the reach of mobile money; Nigeria shows both the potential and vulnerability of diverse agent and fintech networks; and Indonesia illustrates the close relationship among platforms, literacy, payments, and fintech lending. None has fully completed the transition from widespread digital access to resilient enterprises.

Policy should therefore prioritise productive and safe use. Interoperable payments, consent-based data use, responsible cash-flow lending, rapid redress, and targeted support for rural, women-owned, and microenterprises are central to this objective. Digital finance contributes to genuine resilience when it supports enterprise capability rather than merely making transactions more convenient. The evidence also demonstrates the need for stronger longitudinal research on firm survival, recovery, and financial stress

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